



## SCHEDULE A

### MARKED VERSION OF AMENDMENTS

1. **(Once Amended)** A process for the preparation of low molecular weight linear alpha olefins having 4 to 24 carbon atoms, comprising oligomerising ethylene in an inert aliphatic or aromatic solvent in the presence of a catalyst including at least two components, a first component selected from the group consisting of zirconium alkoxide and zirconium aryloxide in association with free alcohol in a ratio of about 1:0.33 to about 1:2.3, and a second component selected from the group consisting of an alkyl aluminum and/or alkyl aluminum halide component.
2. A process as claimed in claim 1 wherein the process is carried-, out under a continuous supply of ethylene and under agitation.
3. A process as claimed in claims 1 wherein the process is performed in semi-continuous mode with ethylene being fed continuously during each period of the process.
4. A process as claimed in claim 1 wherein the catalyst system comprises of at least two components, the first component comprising of zirconium (IV) alkoxide or carboxylate and the second component comprising of triethylaluminum and/or ethylaluminum sesquichloride.
5. A process as claimed in claim 1 wherein the catalyst is of the formula  $Zr(OR)_4-Et_3Al$  wherein R is alkyl or aryl.
6. A process as claimed in claim 1 wherein the catalyst is of the formula  $Zr(OR)_4-Et_3Al_2Cl_3$  wherein R is alkyl or aryl.
7. **(Once Amended)** A process as claimed in claim 1 wherein the catalyst is of the formula  $Zr(OR)_4Et_3Al$  and/or  $Zr(OR)_4Et_3Al_2Cl_3$  wherein R is alkyl or aryl.

8. A process as claimed in claim 5 wherein Et<sub>3</sub>Al is reacted with Zr(OR)<sub>4</sub> in the mole ratio of 10:1 to 60:1.
9. A process as claimed in claim 6 wherein Et<sub>3</sub>Al<sub>2</sub>Cl<sub>3</sub> is reacted with Zr(OR)<sub>4</sub> in the mole ratio of 10:1 to 60:1.
10. **(Once Amended)** A process as claimed in claim 7 wherein Et<sub>3</sub>Al/and/or Et<sub>3</sub>Al<sub>2</sub>Cl<sub>3</sub> is reacted with Zr(OR)<sub>4</sub> in the mole ratio of 10:1 to 60:1.
11. **(Once Amended)** A process as claimed in claim 4 wherein ~~the ratio of zirconium alkoxide is in association with the to the free alcohol in the system is in the~~ in a concentration ratio range of 1:0.33 to 1:12.3.
12. **(Once Amended)** A process as claimed in claim 7 wherein when both Et<sub>3</sub>Al and Et<sub>3</sub>Al<sub>2</sub>Cl<sub>3</sub> are used, the Et<sub>3</sub>Al diluted in solvent is initially charged into the reactor and then Et<sub>3</sub>Al<sub>2</sub>Cl<sub>3</sub> and other catalyst components are added therein.
13. A process as claimed in claim 1 wherein the ethylene pressure is in the range of 18 to 38 kg/cm<sup>2</sup>.
14. A process as claimed in claim 1 wherein the oligomerisation is carried out at a temperature in the range of 80°C to 140°C.
15. A process as claimed in claim 1 wherein, the process is carried out for a time period in the range of 1 hour to 3 hours.
16. **(Once Amended)** A process as claimed in claim 1 wherein, the solvent used is selected from the group consisting of: cyclohexane, toluene and n-octane.
17. A process as claimed in claim 2 wherein the reaction is carried out at an agitator speed of 300 to 1000 rpm.
18. A process as claimed in claim 1 wherein, the zirconium component is selected from the group consisting of zirconium tetra cresylate, zirconium tetra dimethyl phenolate,

zirconium tetra n-butoxide, zirconium tetra iso-propoxide, zirconium tetra n-propoxide, zirconium tetra butyrate and zirconium tetra isobutyrate.

19. **(Once Amended)** A process as claimed in claim 1 wherein said catalyst includes a thiopene-thiophene as a third component to reduce chain growth.
20. **(Once Amended)** A process for the preparation of low molecular weight linear alpha olefins having 4 to 24 carbon atoms, comprising oligomerising ethylene in an inert aliphatic or aromatic solvent in the presence of a catalyst  $Zr(OR)_4\text{-Et}_3Al\text{/and/or } Zr(OR)_4\text{-Et}_3Al_2Cl_3$  wherein R is alkyl or aryl, at a pressure is in the range of 18 to 38 kg/cm<sup>2</sup>, a temperature in the range of 80°C to 140°C for from 1 hour to 3 hours.
21. **(Once Amended)** A process as claimed in claim 17, wherein the mole ratio of  $\text{Et}_3Al\text{/and/or Et}_3Al_2Cl_3$  to  $Zr(OR)_4$  is 10:1 to 60:1.
22. A process as claimed in claim 17 wherein the reaction is carried out at an agitator speed of 300 to 1000 rpm.
23. **(Once Amended)** A process as claimed in claim 17 wherein said catalyst includes a thiopene-thiophene as a third component to reduce chain growth.
24. **(Once Amended)** A process as claimed in claim 17 wherein said solvent is selected from the group consisting of: toluene, n-Octane and cyclohexane.
25. A process for the preparation of low molecular weight linear alpha olefins having 4 to 24 carbon atoms, comprising oligomerising ethylene in an inert aliphatic or aromatic solvent in the presence of a catalyst  $Zr(OR)_4\text{-Et}_3Al_2Cl_3$  wherein R is alkyl or aryl, at a pressure is in the range of 18 to 38 kg/cm<sup>2</sup>, a temperature in the range of 80°C to 140°C for from 1 hour to 3 hours.
26. A process as claimed in claim 25, wherein the mole ratio of  $\text{Et}_3Al_2Cl_3$  to  $Zr(OR)_4$  is 10:1 to 60:1.

27. A process as claimed in claim 25 wherein the reaction is carried out at an agitator speed of 300 to 1000 rpm.
28. **(Once Amended)** A process as claimed in claim 25 wherein said catalyst includes a thiopene thiophene as a third component to reduce chain growth.
29. **(Once Amended)** A process as claimed in claim 25 wherein said solvent is selected from the group consisting of: toluene, n-Octane and cyclohexane.
30. **(New)** The process of claim 1 wherein the process is active in the absence of zirconium tetrahalide.